

WONDERY
KIDS

SEA CREATURES AQUARIUM

WOW-TO
GUIDE



WARNING — Science Education Set. This set contains chemicals and/or parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.

WOW
IN THE
WORLD

THAMES & KOSMOS





SAFETY INFORMATION



WARNING! Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled. Keep the packaging and instructions as they contain important information.

WARNING. Not suitable for children under 6 years. For use under adult supervision. Read the instructions before use, follow them and keep them for reference.

Please remember: You are working with live animals in this kit. This means that by hatching them you are taking responsibility for these creatures. Don't hurt or mistreat the animals, and don't forget to care for them properly as described in these instructions!

Have any questions? Missing any parts? Want to send us donuts?

Our tech support team will be glad to help you!

WARNING! Never look directly into the sun, either with your naked eye or through the magnifying glass. You could blind yourself! Never leave the magnifying glass unattended in the sun. Fire danger!



Thames & Kosmos US
Email: support@thamesandkosmos.com
Web: thamesandkosmos.com
Phone: 1-800-587-2872

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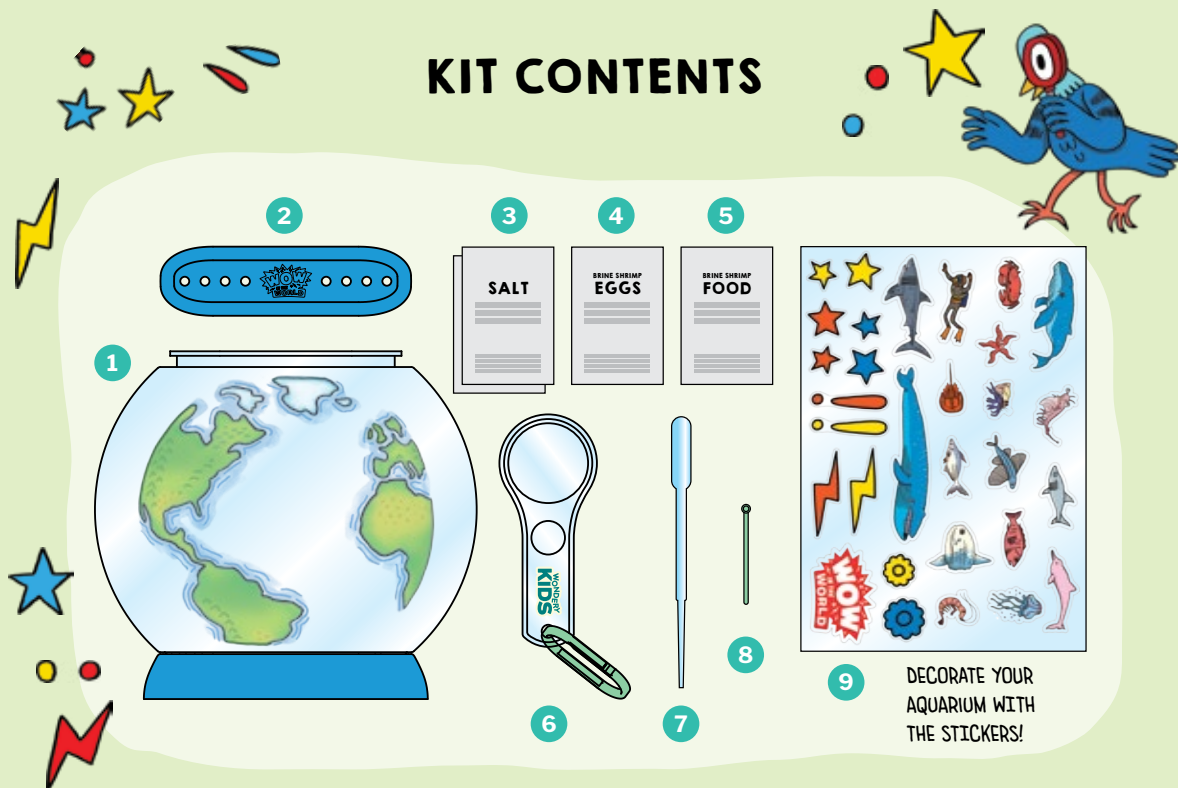
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KIT CONTENTS



DECORATE YOUR
AQUARIUM WITH
THE STICKERS!

Part No.	Description	Quantity
1	Aquarium tank with base	1
2	Aquarium tank lid	1
3	Salt packet	2
4	Brine shrimp eggs packet	1
5	Brine shrimp food packet	1

Part No.	Description	Quantity
6	Magnifying glass with clip	1
7	Pipette	1
8	Small scoop	1
9	Sticker sheet	1

YOU WILL ALSO NEED: WATER, COOKING POT, STOVE

INTRODUCTION

WELCOME TO YOUR SEA CREATURES AQUARIUM WOW-TO GUIDE!



GUY RAZ
(WOW IN THE WORLD HOST)



MINDY THOMAS
(WOW IN THE WORLD HOST)

THIS GUIDE HAS ALL THE INFO YOU NEED FOR RAISING HAPPY, HEALTHY SEA CREATURES.

THESE SEA CREATURES YOU'RE ABOUT TO HATCH ARE CALLED "BRINE SHRIMP" ...



... AND JUST LIKE CRABS AND LOBSTERS WHO ALSO
HATCH FROM EGGS, BRINE SHRIMP ARE CRUSTACEANS!

USE THE QR CODE BELOW TO HEAR SOME WOW FACTS ABOUT BRINE SHRIMP FROM US!



HAPPY HATCHING!



Wow in the World is the
#1 kids science podcast,
hosted by Guy Raz
and Mindy Thomas!



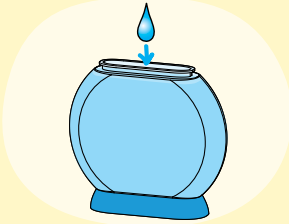
- 1 Grown-ups! Scan this QR code to start your **audio journey**.
- 2 Listen to **Track 1**, a *Wow in the World* Bonus Episode!
- 3 Unlock exclusive **Wow Facts** from Guy & Mindy when you see this symbol in the guide!



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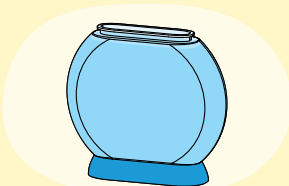
PREPARING THE AQUARIUM



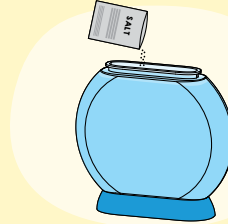
- 1** Rinse the **aquarium tank** and then fill it full of **tap water**. This is a little more than **two cups of water**, or **500 ml**.



- 2** **Adults must do this step!** Pour the water into a clean **cooking pot**. Bring the water to a **boil** on the **stove**, turn it off, and wait for it to return to **room temperature**.



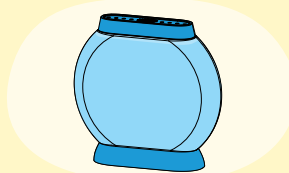
- 3** Pour the **water** back into the **tank**. Leave about **1/4 inch (6 mm)** of room at the top.



- 4** Cut the corner off **one** of the **salt packets** and pour the **entire contents (15 g)** of salt into the **tank**. Stir it around with the **pipette** until dissolved.



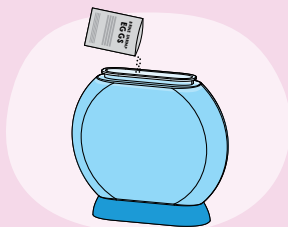
**"Please
pass the
salt!"**



- 5** Put the **lid** on the aquarium. Place it in a **quiet place** that is **evenly warm (69-73°F is ideal)** and receives some daylight, but **not direct sunlight**. The water must not get too hot! Otherwise it will evaporate and pollute too quickly, which means bacteria may spread and the brine shrimp could die.



HATCHING THE SEA CREATURES



- 1 Once you have prepared the aquarium, you can put the **brine shrimp eggs** into the water. Cut the corner off the **egg packet** and pour about **half** of its contents into the water. Stir gently with the **pipette**.



DECORATE THE OUTSIDE OF THE TANK WITH THE INCLUDED **STICKERS!**



- 2 Now you have to wait for **at least 1–2 days**. Look into your aquarium with the **magnifying glass** every day. At some point you will see countless **bright dots** that move in a strange **twitching motion**. It could take a week or more.

Tip: Hold your aquarium up to the light and look for movement inside to see the newly hatched brine shrimp.

What's going on here?

Those tiny twitching dots are **BRINE SHRIMP** that have **HATCHED FROM THE EGGS**. These tiny animals are not yet the full-grown brine shrimp. Just like tadpoles and frogs, or caterpillars and butterflies, the juvenile form of brine shrimp — called the **LARVAL STAGE** or **LARVA** — look completely different from the adult form. For brine shrimp and other **CRUSTACEANS** specifically, the larval stage is called **NAUPLIUS** (plural: **NAUPLII**).



ADULT BRINE SHRIMP

CARE AND FEEDING

Feeding

Do not feed your nauplii for the **first few days**. They live on nutrients that they have with them in their bodies. On the **third day** after hatching, add **no more than one level scoop** of the food into the water. The food should dissolve completely into the water. Repeat this about every two weeks.

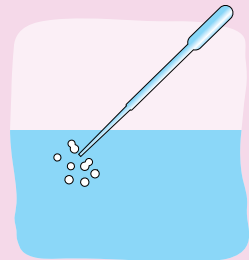
Very important: Be sparing with the food! If food remains in the water, the water quality deteriorates very quickly and the animals die — especially if it gets too warm in the aquarium (above 80°F). You hardly have to worry about your brine shrimp starving. They can go a long time without food, and green algae will soon grow in the tank for them to eat.

Oxygenating and cleaning the water

A couple times a week, it is important to enrich the water with atmospheric **oxygen**. To do this, you must **pump air bubbles** into the tank with the **pipette**, or **gently stir** the water around with the pipette. Do this for about **a minute** each time. Eventually, the algae that grows in the tank will produce oxygen all by itself. Also, if too much gunk builds up at the bottom, you can vacuum it up with the pipette.

Replenishing the water

Because the water is constantly **evaporating**, you must **refill** the water regularly. It's okay if the **salt concentration** increases somewhat due to evaporation; this even protects the animals from mold. By the way, the shrimp usually become redder in color when the salt concentration increases.



HELPFUL TIPS

- If you are having **trouble seeing** your brine shrimp, position the tank so there is a **soft white light behind it**, so you can more clearly see the tiny things inside. Make sure the water is clear and has not been shaken up recently. Let it settle if necessary.

- After shaking or aerating the tank, let it **settle** completely again before trying to observe the brine shrimp.

- Keep the water **temperature** between **65 and 80 degrees Fahrenheit**.

- Make sure the aquarium is getting enough **natural light**, but **not direct sunlight**.

- If the water appears **too dirty**, do not add more food to the tank for a week. Take off the lid and aerate the tank to make sure the brine shrimp are getting enough oxygen.

- If the water **smells bad**, you probably added too much food and the animals have died. Start over with the second packet of salt and the second half of the brine shrimp eggs. This time, keep the tank at a **lower temperature** than before.

- If you want to obtain **more salt**: Brine shrimp prefer a mixture of sodium chloride and other mineral salts. It is best to buy **sea salt without additives** at the supermarket, health food shop, or aquarium shop. Alternatively, **pure table salt** (without added iodide and fluoride) can be used.

- After some time, **floating light-colored formations** may appear. These are probably **old exoskeletons** that the shrimp have shed. They have to shed from time to time in order to grow, because the rigid exoskeleton does not stretch. You can carefully suck these up with the pipette to remove them.

- It is normal for the number of larvae to **decrease rapidly** after hatching: more than 90 percent will die before they have grown up. That still leaves many to grow to adulthood if well cared for.

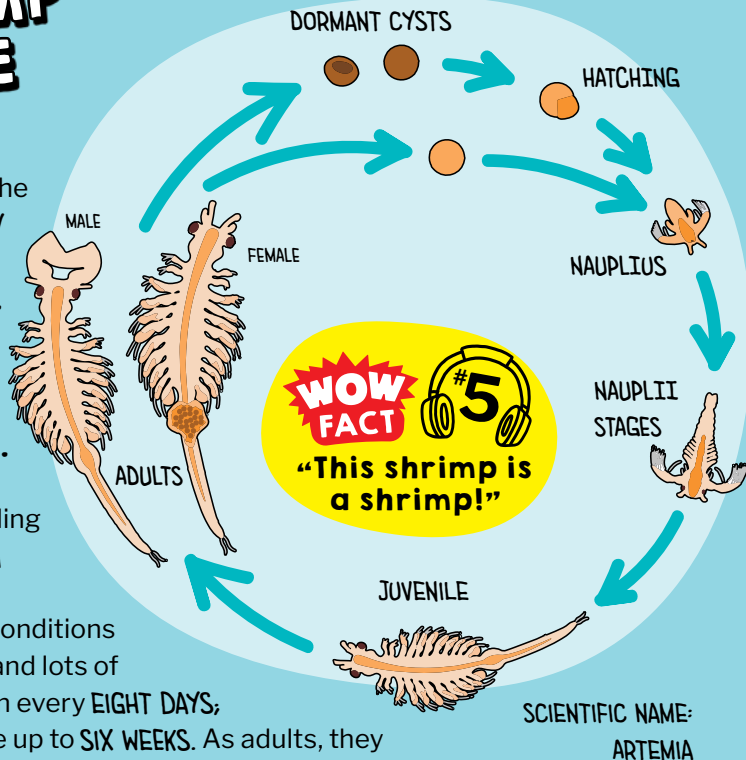


Did your shrimp not make it?

Have you tried **two times** without success? Ask us for **replacement salt and eggs!** Email support@thamesandkosmos.com or visit the **Support section of thamesandkosmos.com** for assistance.

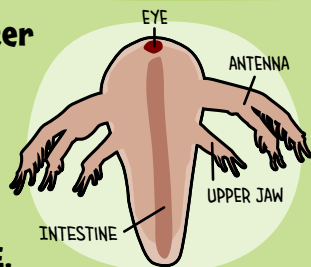
BRINE SHRIMP LIFE CYCLE

Mature female brine shrimp release live **EMBRYOS** when the **SALINITY IS LOW**. If the **SALINITY IS TOO HIGH**, the female lays **EGGS**, called **DORMANT CYSTS**. These hatch when the salinity decreases again. Next, they develop into the **LARVAL STAGE**, called **NAUPLII**. They continue to grow through many **STAGES**, shedding (or **MOLTING**) an **EXOSKELETON** each time, until they reach adulthood. Under the best conditions (warm water, enough food, and lots of oxygen), molting can happen every **EIGHT DAYS**; in bad conditions, it can take up to **SIX WEEKS**. As adults, they divide into **MALES** and **FEMALES**. Then the process begins again!



One-eyed, many-horned, swimming little algae eater

The **NAUPLII** are **BRISTLY AND ONE-EYED**. You can see the drop-shaped body with several leg-like outgrowths covered with many bristles. With the help of these **ANTENNAE**, the animal swims through the water with jerky movements. Inside the translucent body you may recognize the tube-like **INTESTINE** and, at the front of the head, a dark reddish spot: a single **EYE**.



ALL GROWN UP!

Over the course of the next few weeks, look at individual brine shrimp with a magnifying glass every few days. Soon you will see changes: The body becomes more elongated and a **LONG FORKED TAIL** forms. **SWIMMING LEGS** grow at the front end. What is not so easy to see is that **TWO MORE EYES** are also forming. After about a month or so, the animals are fully grown. They can grow up to about **HALF AN INCH** in length.

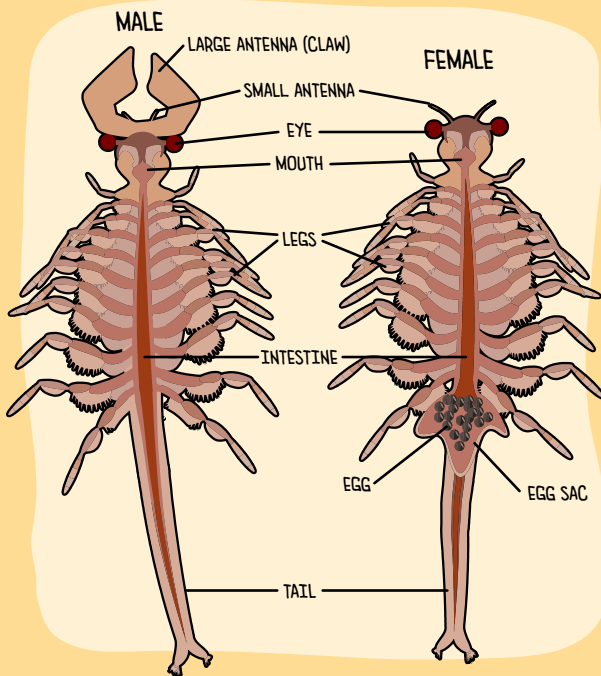
The **COMPOUND EYES** of a brine shrimp are made of thousands of tiny spots called **PHOTORECEPTORS** which give them incredible vision for their size.

The **LITTLE LEGS** are not only used for swimming, but the animal also uses them to **TRANSPORT FOOD** particles to the mouth, which is located at the bottom of the head. These delicate little legs are also used for **BREATHING!** Similar to the gills of fish, they filter oxygen out of the water. That is why they are constantly in rapid motion.

**WOW
FACT**



**"The eyes
have it!"**



**WOW
FACT**



**"Breathing
through
your legs?"**

The males and females are difficult to tell apart, even with the magnifying glass. The males have large **claws** and the females have **egg sacs**. The females can have offspring without a male; this is called **parthenogenesis**.

THE SALTY SEAS

Around 100 MILLION YEARS AGO, the ancestors of the brine shrimp in this kit lived in **NATURAL SALT LAKES**. For many millions of years, they lived alongside the **DINOSAURS**!

For most animals, salt lakes are not a nice place to live. These lakes can get **EXTREMELY SALTY**, because — just like in your aquarium — the water can evaporate while the salt remains. The lakes can even **DRY OUT ENTIRELY**. When it rains, the water returns, but most animals cannot survive through the periods of high salinity or no water at all. So how do the brine shrimp do it?

They lay **DORMANT EGGS!** When a rising salinity tells them that their lake is about to dry out, the brine shrimp **LAY DORMANT EGGS (OR CYSTS) INSTEAD OF GIVING BIRTH TO LIVE YOUNG** as they would otherwise. The dust-fine dormant eggs are particularly hardy. They can **WITHSTAND COLD, HEAT, AND YEARS OF DROUGHT** until rainfall creates a lake again. They also float on the surface, so they easily get caught on birds and brought to other bodies of water, where they can hatch.



"Brine shrimp in spaaaaace!"



THE GREAT SALT LAKE IN UTAH. BRINE SHRIMP LOVE ITS HIGH SALINITY!



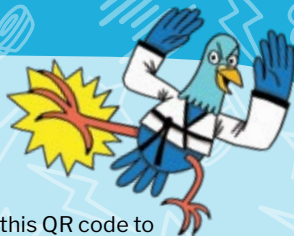
NEXT-LEVEL CHALLENGES

Try these experiments on your own!

1. Use your tank as a bug jar.
2. Fill the tank with pond water and search for living creatures in the water with the magnifying glass.
3. Put soil in the bottom of the tank, plant some seeds, and watch them grow inside the tank.



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This kit was completed by:

Write your name(s) in the spaces below.

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FORWARD!**

When you are done playing and learning with this toy, we encourage you to pass it on to another curious kid!

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